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10/620,127	07/15/2003	Marvin Glenn Wong	10020307-1	7853

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AGILENT TECHNOLOGIES, INC.  
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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT PAPER NUMBER

2841

DATE MAILED: 02/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/620,127

Applicant(s)

WONG ET AL.

Examiner

Ishwar (I. B.) Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 21-28 is/are pending in the application.
- 4a) Of the above claim(s) 2 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-8,21 and 23-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***RCE***

1. This action is in response to a request for continued examination (RCE) filed on January 21, 2005.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Tatsuya Tominaga, Japanese Patent No. JP401245547A.

**Regarding claim 1**, the claim is drafted as Product-by-Process. The process steps in the claim define the following device: **an air bridge having: one circuit component on a substrate, a crossover circuit trace of uniform composition, crossing over the circuit component.** The sacrificial material, as recited on line 3 of the claim, is deposited and then decomposed and removed. Therefore will not be present in the device of claim 1. Further, the device can be made using a sacrificial material or without using a sacrificial material. Furthermore, a process limitation defines the claimed invention over the prior art only to the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is the same as, or obvious over, the prior art. See

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Product-by-Process in MPEP § 2113 and 2173.05(p) and *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985).

Tatsuya Tominaga, in figure 3, discloses an air bridge having: one circuit component (2) on a substrate (1), a crossover circuit trace (4) of uniform composition (as can be seen in the figure), crossing over the circuit component (2). As such Tatsuya Tominaga discloses all of the structural elements of the device of claim 1 and therefore, Tatsuya Tominaga anticipates it.

**Regarding claim 21**, the claim is drafted as Product-by-Process. The process steps in the claim define the following device: **one circuit component on a substrate, a crossover circuit trace of uniform composition, crossing over the circuit component, and being directly supported by the substrate on opposite sides**. The sacrificial material, as recited on line 3 of the claim, is deposited and then decomposed and removed. Therefore will not be present in the device of claim 21. Further, the device can be made using a sacrificial material or without using a sacrificial material.

Furthermore, a process limitation defines the claimed invention over the prior art only to the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is the same as, or obvious over, the prior art. See Product-by-Process in MPEP § 2113 and 2173.05(p) and *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985).

Tatsuya Tominaga, in figure 3, discloses an air bridge having: one circuit component (2) on a substrate (1), a crossover circuit trace (4) of uniform composition

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(as can be seen in figure), crossing over the circuit component (2), and being directly supported by the substrate (1) on opposite sides, (see figure 2). As such Tatsuya Tominaga discloses all of the structural elements of the device of claim 21 and therefore, Tatsuya Tominaga anticipates it.

4. Claims 1, 3, 4, 21, 23 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Burns, US Patent No. 3,729,816.

**Regarding claim 1**, the claim is drafted as Product-by-Process. The process steps in the claim define the following device: **an air bridge having: one circuit component on a substrate, a crossover circuit trace of uniform composition, crossing over the circuit component.** The sacrificial material, as recited on line 3 of the claim, is deposited and then decomposed and removed. Therefore will not be present in the device of claim 1. Further, the device can be made using a sacrificial material or without using a sacrificial material. Furthermore, a process limitation defines the claimed invention over the prior art only to the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is the same as, or obvious over, the prior art. See Product-by-Process in MPEP § 2113 and 2173.05(p) and *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985).

Burns, in figure 5, discloses an air bridge having: one circuit component (23) on a substrate (21), a crossover circuit trace (29) of uniform composition (as made of same

conductive material), crossing over the circuit component (23). As such Burns discloses all of the structural elements of the device of claim 1. Therefore, Burns anticipates it.

**Regarding claim 3**, the applicant is further claiming polynorbornene as a sacrificial material used for forming the air bridge. However, using polynorbornene as a sacrificial material for forming the air bridge is further a part of the process steps and as explained and applied to claim 1 above the sacrificial material is deposited and then decomposed and removed. Therefore will not be present in the device of claim. As such Burns discloses all of the structural elements of the device of claim 3 as applied to claim 1 above. Therefore, Burns anticipates it.

**Regarding claim 4**, Burns further disclose the circuit components comprise a circuit trace (circuit path 23, column 4, line 21-24).

**Regarding claim 21**, the claim is drafted as Product-by-Process. The process steps in the claim define the following device: **one circuit component on a substrate, a crossover circuit trace of uniform composition, crossing over the circuit component, and being directly supported by the substrate on opposite sides.** The sacrificial material, as recited on line 3 of the claim, is deposited and then decomposed and removed. Therefore will not be present in the device of claim 21. Further, the device can be made using a sacrificial material or without using a sacrificial material. Furthermore, a process limitation defines the claimed invention over the prior art only to

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the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is the same as, or obvious over, the prior art. See Product-by-Process in MPEP § 2113 and 2173.05(p) and *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985).

Burns, in figure 5, discloses an air bridge having: one circuit component (23) on a substrate (21), a crossover circuit trace (29) of uniform composition (as made of same conductive material), crossing over the circuit component (23), and being directly supported by the substrate on opposite sides, (base that hold in place, i. e. it is supported directly by substrate 21). As such Burns discloses all of the structural elements of the device of claim 21. Therefore, Burns anticipates it.

**Regarding claim 23**, the applicant is further claiming polynorbornene, as a sacrificial material used for forming the air bridge. However, using polynorbornene as a sacrificial material for forming the air bridge is further a part of the process steps and as explained and applied to claim 1 above the sacrificial material is deposited and then decomposed and removed. Therefore will not be present in the device of claim. As such Burns discloses all of the structural elements of the device of claim 23 as applied to claim 21 above. Therefore, Burns anticipates it.

**Regarding claim 24**, Burns further disclose the circuit components comprise a circuit trace (circuit path 23, column 4, line 21-24).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-8 and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burns, US Patent No. 3,729,816, as applied to claims 1 and 21 above, and further in view of Middlehurst et al., US Patent No. 6,604,967, alternately Leigh et al., US Patent No. 5,986,893.

**Regarding claim 5**, the applicant is further claiming the circuit trace comprises a signal trace.

Burns discloses all the features of the claimed invention including the circuit trace (23, figure 5) as applied to claim 4 above, but fails to explicitly disclose the said trace comprise a signal trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).



Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the circuit trace comprises a signal trace" implies that the circuit trace is used as a signal trace. As disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for signal transmission.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the trace of Burns as a signal trace, as taught by Middlehurst or Leigh, in order to transmit a signal.

**Regarding claim 6**, the applicant is claiming the circuit trace comprises a ground trace.

Burns discloses all the features of the claimed invention including the circuit trace (23, figure 5) as applied to claim 4 above, but fails to explicitly disclose the said trace comprise a ground trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the circuit trace comprises a ground trace" implies that the circuit trace is used as a ground trace and as disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for providing ground connection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the circuit trace of Burns as a ground trace, as taught by Middlehurst or Leigh, in order to provide the grounding connection.

**Regarding claim 7**, the applicant is claiming the circuit trace comprises a power trace.

Burns discloses all the features of the claimed invention including the circuit trace (23, figure 5) as applied to claim 4 above, but fails to explicitly disclose the said trace comprise a power trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the circuit trace comprises a power trace" implies that the circuit trace is used as a power trace and as disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for providing power connection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the circuit trace of Burns as a power trace, as taught by Middlehurst or Leigh, in order to provide the power connection.

**Regarding claim 8**, the applicant is claiming the cross over circuit trace comprises a signal trace.

Burns discloses all the features of the claimed invention including the crossover circuit trace (29, figure 5) as applied to claim 1 above, but fails to explicitly disclose the said crossover trace comprises a signal trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

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Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the crossover circuit trace comprises a signal trace" implies that the crossover circuit trace is used as a signal trace and as disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for providing signal connection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the crossover circuit trace of Burns as a signal trace, as taught by Middlehurst or Leigh, in order to transmit a signal.

**Regarding claim 25**, the applicant is further claiming the circuit trace comprises a signal trace.

Burns discloses all the features of the claimed invention including the circuit trace (23, figure 5) as applied to claim 24 above, but fails to explicitly disclose the said trace comprise a signal trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the circuit trace comprises a signal trace" implies that the circuit trace is used as a signal trace and as disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for signal transmission.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the circuit trace of Burns as a signal trace, as taught by Middlehurst or Leigh, in order to transmit a signal.

**Regarding claim 26**, the applicant is claiming the circuit trace comprises a ground trace.

Burns discloses all the features of the claimed invention including the circuit trace (23, figure 5) as applied to claim 24 above, but fails to explicitly disclose the said trace comprise a ground trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

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Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore to be used as signal trace, power trace or ground trace. Furthermore, the limitation "the circuit trace comprises a ground trace" implies that the circuit trace is used as a ground trace and as disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for providing ground connection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the circuit trace of Burns as a ground trace, as taught by Middlehurst or Leigh, in order to provide the grounding connection.

**Regarding claim 27**, the applicant is claiming the circuit trace comprises a power trace.

Burns discloses all the features of the claimed invention including the circuit trace (23, figure 5) as applied to claim 24 above, but fails to explicitly disclose the said trace comprise a power trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces

46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the circuit trace comprises a power trace" implies that the circuit trace is used as a power trace and as disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for providing power connection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the circuit trace of Burns as a power trace, as taught by Middlehurst or Leigh, in order to provide the power connection.

**Regarding claim 28**, the applicant is claiming the cross over circuit trace comprises a signal trace.

Burns discloses all the features of the claimed invention including the crossover circuit trace (29, figure 5) as applied to claim 21 above, but fails to explicitly disclose the said crossover trace comprises a signal trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces

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46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the crossover circuit trace comprises a signal trace" implies that the crossover circuit trace is used as a signal trace and as disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for providing signal connection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the crossover circuit trace of Burns as a signal trace, as taught by Middlehurst or Leigh, in order to transmit a signal.

### ***Response to Arguments***

6. Applicant's arguments with respect to claims 1, 3-8, 21 and 23-28 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.



Lepselter, US Patent No. 3,461,524 discloses an air bridge with a cross over trace (4) directly supported on the substrate 91).

Lammert, US Patent 5,817,446, in figure 4, discloses an air bridge with a crossover trace (36) directly supported by integrated circuit substrate (20).

Hisaka, US Patent No. 5,677,574, in figure 1B, discloses an air bridge with a crossover trace (7) directly supported by the substrate (1), as the substrate is a base that holds the crossover structure.

Eldridge, US Patent 6,458,687, in figure 1B, discloses an air bridge with a crossover trace (23) directly supported by the substrate assembly (14).

Laney et al., US Patent No. 6,504,447, in figure 2, discloses an air bridge with a crossover trace (11) directly supported by the substrate (9), as the substrate is a base that holds the crossover structure.

Berry et al., US Patent No. 4,141,055, in figure 8, discloses an air bridge with a crossover trace (23), directly supported by substrate (10).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571) 272 1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ishwar (I. B.) Patel

Examiner

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February 13, 2005